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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,180	11/14/2003	Peter C. Rieke	50005-162	9390
32215 7590 11/02/2007 KLARQUIST SPARKMAN, LLP 121 SW SALMON STREET, SUITE 1600 ONE WORLD TRADE CENTER PORTLAND, OR 97204			EXAMINER LEWIS, BEN	
			ART UNIT 1795	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/714,180

Applicant(s)

RIEKE ET AL.

Examiner

Ben Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-39, 96-101 and 103-114 is/are pending in the application.
- 4a) Of the above claim(s) 96-101, 103-108, 110 and 111 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-29 and 31-39 is/are rejected.
- 7) ☒ Claim(s) 11, 30, 109 and 112-114 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/21/06</u> . | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2-3, 21-22 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claims 2-3 and 21-22 recites the limitation "B-site atoms". There is insufficient antecedent basis for this limitation in the claim.
4. Claim 38 recites "a system for utilizing electrical energy produced by said fuel cells" this limitation does not further limit claim 38 since this claim is directed to a fuel cell assembly which excludes auxiliary components.

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 17 and 36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter

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which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The recitation of "said cathode layer comprises a substantially homogenous mixture of a copper-substituted ferrite material and a finely-divided form of a second material" in claims 17 and 36 is not present in the specification as originally filed.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-7, 9-10, 15-16, 18-19, 20, 23-25, 26, 28-29, 34 and 37-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Forthmann et al. (Ceramic coatings for cathode contacts of solid oxide fuel cells, *Werkstoffwoche '98, Band III: Symposium 3, Werkstoffe fuer die Energietechnik; Symposium 7, Werkstoffe und Korrosion, Munich, Sept., 1998 (1999), Meeting Date 1998, 149-154.*)

With respect to claims 1 and 4, 5, 6, 15, 16, 18, 20, 23, 24, 25, 34, 35, 37 Forthmann et al. disclose a planar solid oxide fuel cell characterized by 2 porous

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electrodes and a gas impermeable solid electrolyte. The fuel cell cathode contact layer comprised a perovskite (LASK)  $\text{La}_{0.6} \text{Sr}_{0.4} \text{Fe}_{0.8} \text{Cu}_{0.2} \text{O}_3$  (See Abstract).

With respect to claims 2 and 21, Frothmann et al. teach that the fuel cell cathode contact layer comprised a perovskite (LASK)  $\text{La}_{0.6} \text{Sr}_{0.4} \text{Fe}_{0.8} \text{Cu}_{0.2} \text{O}_3$  (See Abstract). Therefore the copper is present at 4 atomic percent.

With respect to claim 3, 7, 22 and 26, Frothmann et al. teach that the fuel cell cathode contact layer comprised a perovskite (LASK)  $\text{La}_{0.6} \text{Sr}_{0.4} \text{Fe}_{0.8} \text{Cu}_{0.2} \text{O}_3$  (See Abstract). Therefore the copper is present at 4 atomic percent. 4 atomic percent reads on "about 5 atomic percent."

With respect to claims 9-10 and 28-29, Frothmann et al. disclose a planar solid oxide fuel cell characterized by 2 porous electrodes and a gas impermeable solid electrolyte. The fuel cell cathode contact layer comprised a perovskite (LASK)  $\text{La}_{0.6} \text{Sr}_{0.4} \text{Fe}_{0.8} \text{Cu}_{0.2} \text{O}_3$  (See Abstract).

The instant specification recites: The perovskite crystal structure of an A-site and B-site-substituted lanthanum ferrite perovskite is represented by the general formula:  $\text{La}_{1-x} \text{A}_x \text{B}_y \text{Fe}_{1-y} \text{O}_3$ . See Page 11, Lines 20-22. Frothmann et al do not disclose any polarization resistance data. However, it is the position of the examiner that such properties are inherent, given that Frothmann et al and the present application

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utilize the same copper-substituted lanthanum ferrite material. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claim 19 and 39, Forthmann et al. teach that the (LASK)  $\text{La}_{0.6}\text{Sr}_{0.4}\text{Fe}_{0.8}\text{Cu}_{0.2}\text{O}_3$  were sintered onto the interconnectors of the fuel cell stack (See abstract).

With respect to claim 19 and 38, Forthmann et al. teach interconnects with gas passages (See Fig. 2).

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 12 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forthmann et al. (Ceramic coatings for cathode contacts of solid oxide fuel cells, Werkstoffwoche '98, Band III: Symposium 3, Werkstoffe fuer die Energietechnik; Symposium 7, Werkstoffe und Korrosion, Munich, Sept., 1998 (1999), Meeting Date 1998, 149-154.) in view of Seabaugh et al. (U.S. Pub. No. 2003/0003237A1).

With respect to claims 12 and 31, Forthmann et al. disclose a solid oxide fuel cell in paragraph 4 above. Forthmann et al. do not specifically teach an interlayer between said electrolyte layer and said cathode layer. However, Seabaugh et al. disclose a ceramic electrolyte coating (title) wherein there are also advantages of applying interlayer films between the porous support electrode plate (either the LSM cathode or the NiO/YSZ anode) and the deposited electrolyte (YSZ) film. The purpose of such interlayer films could be either to increase performance (e.g. by incorporating catalytic materials that enhance electrochemical reactions or by locally reducing the size of particles and pores so that the density of electrochemical reaction sites is increased), or to prevent adverse chemical reactions between the support electrode and deposited film during sintering or co-sintering (Paragraph 0015). Therefore it would have been obvious to incorporate the interlayer of Seabaugh et al. into the fuel cell system of Forthmann et al. because Seabaugh et al. teach that The purpose of such interlayer films could be either to increase performance (e.g. by incorporating catalytic materials that enhance electrochemical reactions or by locally reducing the size of particles and pores so that the density of electrochemical reaction sites is increased), or to prevent adverse chemical reactions between the support electrode and deposited film during sintering or co-sintering (Paragraph 0015)

11. Claims 13-14 and 33-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forthmann et al. (Ceramic coatings for cathode contacts of solid

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oxide fuel cells, Werkstoffwoche '98, Band III: Symposium 3, Werkstoffe fuer die Energietechnik; Symposium 7, Werkstoffe und Korrosion, Munich, Sept., 1998 (1999), Meeting Date 1998, 149-154.) in view of Badding et al. (U.S. Pub. No. 2001/0044041 A1).

With respect to claims 13-14 and 33-33, Forthmann et al. disclose a solid oxide fuel cell in paragraph 4 above. Forthmann et al. do not specifically teach wherein the copper substituted ferrite material comprises a layer having a thickness from about 1 to 50 microns or having a thickness from about 1 to 30 microns. However, Badding et al. disclose high performance solid oxide electrolyte fuel cells (title) wherein With more conventional perovskite-type electrode materials such as  $\text{La}_{0.85}\text{Sr}_{0.15}\text{MnO}_3$ , or other manganites, electrode resistivity is typically about  $10^{-2}$  ohm-cm, or essentially 3 orders of magnitude higher than the resistivities of precious metal-containing electrodes. In these cases the electrode designs generally involve smaller electrodes with shorter current path lengths (as low as 2 mm), higher electrode thicknesses, (>20 microns), and/or highly conductive current collectors in contact with the electrodes. Electrodes less than around 20 microns in thickness, however, are generally preferred for minimizing material usage and enhancing the flexibility and thermal shock resistance of the electrode/electrolyte structure (Paragraph 0056). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the electrode thickness of Badding et al. for the cathode thickness of Forthmann et al. because Badding et al. teach that Electrodes less than around 20 microns in thickness, however, are generally preferred for minimizing material usage and enhancing the



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flexibility and thermal shock resistance of the electrode/electrolyte structure (Paragraph 0056).

***Allowable Subject Matter***

Claims 8, 27, 109, 112-114 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 8, 27, 109, 112-114 would be allowable because the prior art does not disclose or suggest B-site dopant selected from the group consisting nickel, cobalt, manganese, aluminum and chromium.

Claims 11 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 30 would be allowable because the prior art does not disclose or suggest wherein the copper-substituted ferrite composition is in contact with said electrolyte layer.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481.

The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ben Lewis

  
PATRICK RYAN  
SUPERVISOR, EXAMINER

Patent Examiner  
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